



Cinematographer Reed Smoot and his camera were wrapped in plastic in order to get a shot of the painter robot system from inside a car.

BALLET ROBOTIQUE

Capturing the Beauty of High Tech Assembly Lines

by BUCK O. SHAW

"Don't anybody say 'industrial film.' We're going to give **BALLET ROBOTIQUE** all the big-time love and attention of a feature." So said Bob Rogers, producer/director of the new General Motors film, **BALLET ROBOTIQUE**.

"We really did treat it like a feature," says Rogers. "We shot 35mm with an Arri III and recorded the track in six part stereo with the Royal Philharmonic Orchestra in London. But the first step was getting independent feature cinematographer Reed Smoot interested in the project." Smoot's credits include *WIND WALKER*, *TAKE DOWN*, *HARRY'S WAR* and the Academy Award winning feature documentary "The Great American Cowboy."

"The subject of robots in manufacturing is obviously very industrial but Bob's concept from the start was that this was to be an entertainment rather than just a documentary," said Smoot. "The dedication to that approach is what made working on it so challenging and worthwhile." Even so, Smoot did at first have a few "minor" reservations. No location scout? Four cities in two weeks? A different local equipment package and crew in each location? Shooting

in factories around splattering molten aluminum, explosive lacquer thinner fumes, spark throwing welding robots and dangerous automated equipment? All of this done without a second disturbing the production flow of the factories? "Oh yes. One more thing," added Rogers. "The factories are kind of ugly but your cinematography is going to make them look like **STAR WARS**."

"That all made perfect sense," said Smoot. "From the director's point of view it had to look high tech because we were telling the story of General Motors' robotics program which is all state-of-the art technology. To communicate that to a non-technical audience that's been to see **STAR WARS** and *E.T.* we had to make those factory locations look as high tech as **STAR WARS** and *E.T.* Bob communicated that very clearly from the outset. We knew going in that the standards would be extremely high compared with the budget."

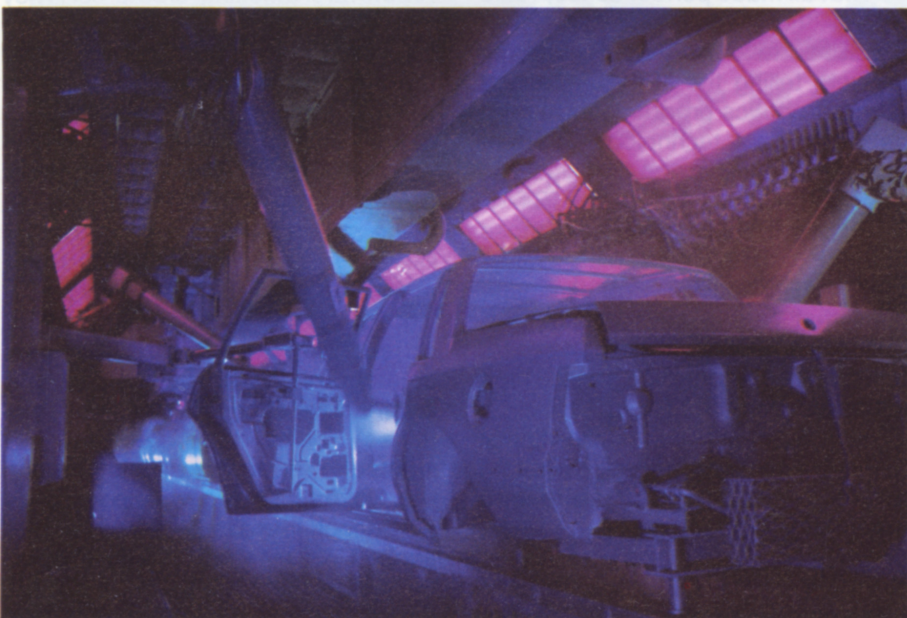
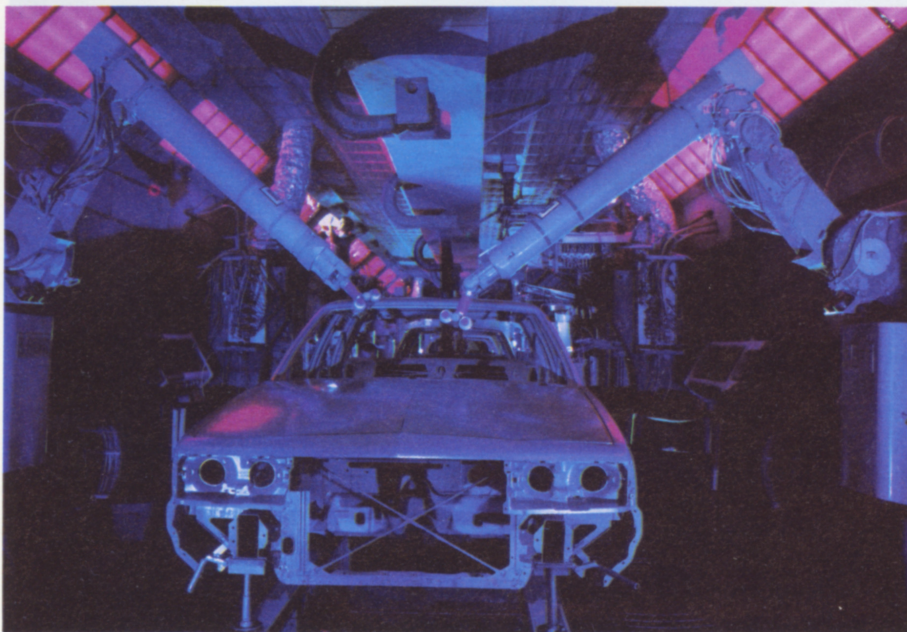
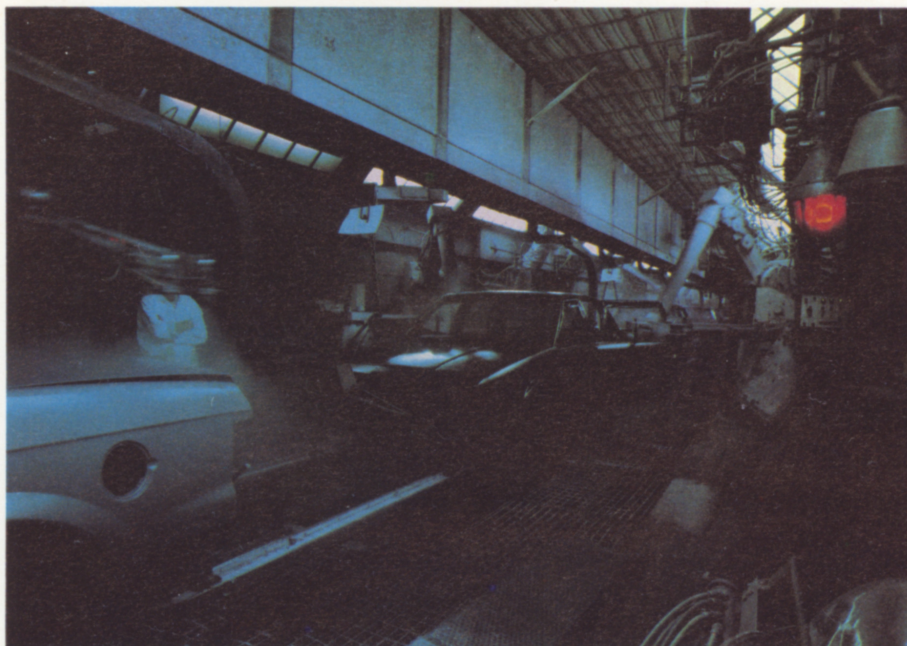
Using some of the extraordinary methods herein described, the team obtained the desired results and more.

ROBOTIC STARS

The mood was everything: "In the

dark abyss, deep blue swirls of smoke curl up from the depths below. An eerie red glow emanates from within the blackness. Suddenly the gleaming silver arms of the robots rear up and plunge forward, shooting sparks that leap and pirouette in arcs of fire. Spitting sparks, breathing smoke, they crackle as they plunge again and again to attack."

Even without the art direction, the robots are amazing creatures. They are incredibly strong and precise (they maneuver a 200 pound welding gun into position accurate within 1/16 of an inch) and they move with a grace that would make a ballet dancer jealous. "Each type of robot has its own personality," said Rogers. "One moves like a chicken. Another like a cat. One paint spraying robot moves like seaweed, gracefully swaying and curling with the current. Our objective was to use the cinematographer's art to enhance and emphasize each of these personalities. For example, we knew we wanted to use low key lighting on the big welders so the welding sparks would look like a laser battle in outer space. We planned to synchronize them with the *1812 Overture* so that the explosions of sparks would take



the place of the fireworks and cannons," said Rogers.

The crew also planned to metamorphasize a chassis paint sprayer robot into a mysterious creature in an "underwater" cavern. They would bathe the paint spray booth in blue green light and give the little robot a pair of red eyes that would glow in the green darkness. As he went about his regular routine of spraying paint from his nose onto the chassis, he would appear to actually be snooping around, looking for spots that needed spray painting. "By dramatizing the personality of each robot, we're extending an old animation tradition," says Rogers.

The old animators of the golden era were always putting a personality into an inanimate object. An old gnarled tree could have a ghostly face and its fingers clutching at the hem of Snow White's dress. In another example, they gave Bambi many of the movements of a household cat, nuzzling his mother for affection. Giving each robot a personality helps us relate these strange visions to our previous experience. That makes them more memorable.

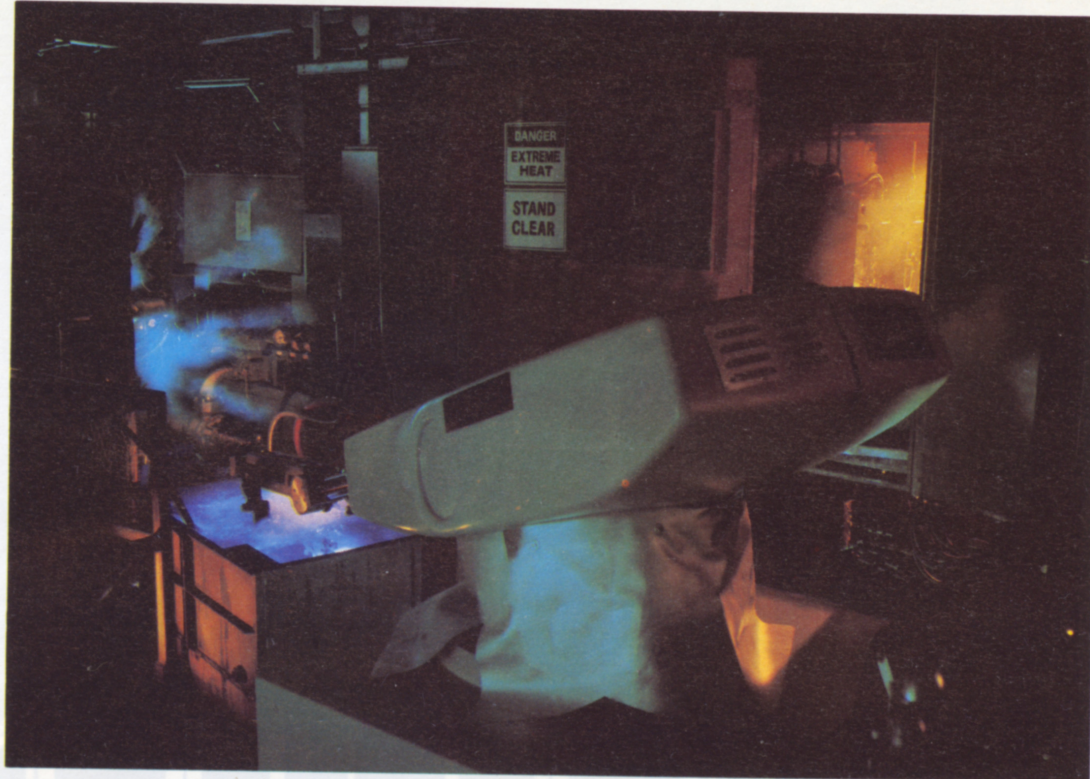
"Besides," says Rogers, "This way they're more fun."

LOCATION SCOUTING

By a unique method of location scouting, the crew always knew just what to expect. Rogers had been the only person able to scout the locations. He returned with an extensive collection of color prints taken with Kodak ASA 400 color print film. But in addition, he carried with him a JVC half-inch video system on which he recorded all of his plant tours. "We got a terrific sense of each location from the videotape," said Smoot. "We saw how the machinery moved. We heard what it sounded like. Bob would roll tape as he walked into the place and then pan all around the room, zooming in on details he wanted to point out, all the while making comments on the audio track. We studied the

(TOP) The painter robot system as it appears in everyday life. (MIDDLE) The same system as it appears in the film thanks to red cellophane over the fluorescents and concealed HMI lights. (BOT-TOM) a 250 watt battery-operated light inside a car catches the paint spray as the robot opens the car door.

To heighten the effect as a robot dunks a hot part into a quench tank, blue underwater lights were placed in the tank, a burst of CO₂ provided extra steam and a bee smoker and some fire extinguishers created additional smoke. (BELOW) A rather dull looking control room was dressed up with a few "blinkie boxes" and transformed into a much more dramatic looking environment with a little low key lighting.



tapes in Bob's office in Burbank during the pre-production and then carried them with us on the road for a quick brush-up on whatever city we were flying to next. It saved us a tremendous amount of time and money. As a result, every location was a *déjà vu*. We'd walk into a place we'd never been and feel like we'd been there before.'

THE CINEMATOGRAPHY

Knowing what kind of environment to expect was vital, due to the extreme conditions under which the robots had to be shot:

1. The factories were almost always in operation. To stop the line would cost around \$6,000 per minute and was "an unthinkable sin to our efficiency-minded hosts."

2. The situations were always uncomfortable and usually dangerous. The robots to be filmed had all been assigned to the least desirable locations in the plant: Diecasting operations with splashing molten aluminum, smelly (possibly explosive) paint spray booths and giant spot-welding guns shooting plumes of sparks 50 feet in every direction.

3. The factories were set up for making cars, not films. They featured a mixture of every kind of light imaginable, many of which could not be turned off for safety reasons. Everything was bolted to the floor, so there always seemed to be a big piece of unfriendly equipment exactly where Rogers wanted to put the camera.

4. Most troublesome was the factory art direction, a confusing array of

tangled shapes painted bright colors and then smeared with factory grime or paint overspray. In other words, it was hardly the high tech look that the film required.

"To begin with we tried to get rid of as much of the fluorescent, mercury vapor, daylight or whatever other light sources as possible," said Smoot. "Sometimes the factory circuits covered too wide an area and so we couldn't have workers in nearby areas working in the dark. On those occasions we had the plant electricians get up on cherry pickers and either unplug, un-bulb or cover the instruments we wanted off." There was also a basic problem of visibility. The shafts, tubes and industrial shapes of the robots were perfectly camouflaged by the confusing array of



shafts, tubes and industrial shapes in the background. "We did several things to make our subject stand out," said Smoot. "First we would try to screen out the background with a roll of seamless. Or, better still, we would screen it out with a wall of smoke." Smoot and company used a bee smoker burning bee gum. "The guys in the factories got a big kick out of it. You know, their environment is the same day after day. In Doraville, the smoke got a big burst of cheers." In addition, Smoot used carefully controlled colored lights to shape the robots and separate them from the background.

"That's one of the big things that attracted me to Reed," said Rogers. "I saw a picture called *THE GREAT BRAIN* which Reed shot which was all pretty awful except for the outstanding cinematography. He used a lot of colored light sources to shape each scene and give it mood. I think that shows a lot more imagination than just using white light."

Furthermore, Rogers continues, "the colored light treatment hid a multitude of visual sins. Some of those factories were pretty ugly and it certainly wasn't in our budget to clean them up. The colored light approach gave them a magical high tech look. From the beginning we decided we would never use white light."

"You can imagine what the timers at CFI thought of it," said Smoot. "It was all colored lights and robots. No people. No flesh tones." Yet Smoot wouldn't see dailies until he returned to Los Angeles at the end of the shoot. He would instead have to rely on telephone evaluations of others.

"Communication with the lab is so important. I told them ahead of time what we were trying to achieve with the color so they wouldn't try to correct it out of our dailies. I was on the phone to them almost every night for the first week or so. Shooting a chip chart also helped them out a lot." For each lighting setup, gaffer Dennis Peterson would also place an unfiltered 250 watt slate light right next to the camera. At the beginning of each new roll, 1st assistant Gordon Lonsdale would shoot the roll slate plus a burst of color chip chart and grey scale, under the unfiltered "white" (3200°K) light to give the timer a reference point.

The production was shot on Eastman 5247 without 85 filters even though most of the sources were daylight balanced HMI's covered with

colored gels. Occasionally there were fluorescent fixtures in the scene which were also given colored gel. "It was a real circus keeping track of all of those color sources," said Rogers, "but somehow Reed did it."

One unusual complication was the need to keep the lighting instruments clean. On two occasions scenes were shot inside paint spray booths where the lights and cables had to be protected from paint overspray not to mention the potentially explosive lacquer thinner making up the majority of the spray. On another occasion scenes were shot adjacent to a magnet manufacturing area where the floor was coated in an oily sludge filled with metal filings. "That was no real problem" said Smoot, "We just had to load and unload our cases some distance away and be very careful with the Arri III. The worst part was coiling up the lighting cables afterward. They all had to be cleaned. It was a real mess but we dealt with it."

The problems couldn't be taken so lightly in the paint spray booths. Here an explosion could kill the entire crew and shut down the plant for several weeks. The plant safety people required that all lights be sealed beam and that all power switches be removed to outside the booth. Their fear was that a spark from a junction or switch would set off the lacquer thinner fumes. This requirement was one reason for selecting the HMI's which although not completely sealed, satisfied the safety people. The next problem was the camera battery and power switch which were finally allowed into the booth after some fast talking and some fast wrapping. The battery, the cable and the switch area were wrapped in visqueen and made airtight with tightly wound fiber packing tape. Needless to say, the rest of the camera was covered in visqueen to protect it from paint overspray.

The spray booth in Doraville, home of the Numerically Controlled Painter Robot (N.C. Painter for short) included two banks of fluorescent lights which would have cost a fortune to cover with gels. "Instead, we used party gel—a short of red cellophane like you would wrap festive decorations in. We got 800 feet of it from a wholesale party shop and that's just how much it took."

The spray booth was 400 feet long with a row of lights on each side. Double sided carpet tape proved to be the only thing that would stick to the glass covers of the fluorescent fix-

tures as they were covered with paint overspray.

"The noise level in those factories is incredible," says Rogers. "You put your lips up to the ears of the guy next to you and yell and he says 'what?'. It was interesting watching how quickly we all adapted to hand signals. Reed and his guys, Dennis and Gordon adapted faster because they had done a lot of action scenes on other features with stampeding horses and explosions and whatnot where the noise level required hand signals for communication."

LOGISTICS

Initially, Smoot's biggest concern had been logistics. The crew carried the Arri III from Los Angeles but the HMI's, grip equipment and extra crew members had to be obtained locally. "The schedules all overlapped," said Smoot. "As we were finishing shooting in Atlanta, a guy we'd never worked with before was checking a package out of New York and driving it to Rochester. The schedule called for us to arrive in Rochester and immediately begin shooting with this lighting and grip package we'd never seen before. There were four overlapping moves like this. I was very concerned we'd end up with an incompatible or incomplete package somewhere along the line." Luckily there were no serious logistical problems. "Our production manager, Chris Coles saved us," said Rogers. (Coles performed similar chores on *SUPERMAN II* and *SUPERMAN III* locations.) "He was always on the phone updating the equipment list for Detroit or confirming the supply list for Dayton. Good location scouting won't help the cinematographer unless he has the right equipment and materials. That was just a small part of Chris' job but he handled it extremely well. It's amazing we didn't have problems, the schedules were so tight. Suppose we had a problem in Dayton. You just don't run down the street and get a couple of extra HMI's."

When the accountants finished adding, it turned out that *BALLET ROBOTIQUE* had come in under budget as well as on time. Now that it is finished, Smoot and Rogers agree they'd like to go back. "We'd like to shoot a gun fight and chase through an operating manufacturing plant. Visiting those plants is like going to another planet. What a terrific background for a chase." ■